THAMES RIVER BASIN
NORWICH, CONNECTICUT

TAFTVILLE RESERVOIR NO. 2 DAM

CT. 00201

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS. 02154

JANUARY 1979

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Taftville Reservoir No.2 Dam

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Taftville Reservoir No.2 dam is a zoned embankment about 667 ft. long with a concrete core wall, is 16 ft. wide at the crest, and has a maximum height of about 30 ft. Based on both height and storage capacity, Taftville Reservoir No.2 Dam is classified as a small dam. The dam has therfore been classified as having a significant hazard potential. The dam appears to be in good condition.

4107-4410

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02154

REPLY TO
ATTENTION OF:

NEDED

APR 20 1979

Honorable Ella T. Grasso
Governor of the State of Connecticut
State Capitol
Hartford, Connecticut 06115

Dear Governor Grasso:

I am forwarding to you a copy of the Taftville Reservior No. 2 Dam Phase I Inspection Report, which was prepared under the National Program for Inspection of Non-Federal Dams. This report is presented for your use and is based upon a visual inspection, a review of the past performance and a brief hydrological study of the dam. A brief assessment is included at the beginning of the report. I have approved the report and support the findings and recommendations described in Section 7 and ask that you keep me informed of the actions taken to implement them. This follow-up action is a vitally important part of this program.

A copy of this report has been forwarded to the Department of Environmental Protection, the cooperating agency for the State of Connecticut. In addition, a copy of the report has also been furnished the owner, the City of Norwich, Department of Public Utilities, 34 Shetucket Street, Norwich, Connecticut 06360.

Copies of this report will be made available to the public, upon request, by this office under the Freedom of Information Act. In the case of this report the release date will be thirty days from the date of this letter.

I wish to take this opportunity to thank you and the Department of Environmental Protection for your cooperation in carrying out this program.

Sincerely yours,

JOHN P. CHANDLER
Colonel, Corps of Engineers
Division Engineer

Incl
As stated

TAFTVILLE RESERVOIR NO. 2 DAM

CT 00201

THAMES RIVER BASIN
NORWICH, CONNECTICUT

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

NATIONAL DAM INSPECTION PROGRAM
PHASE I INSPECTION REPORT

Identification No.:	CT 00201
Name of Dam:	Taftville Reservoir No. 2
City:	Norwich
County and State:	New London, Connecticut
Stream:	Unnamed tributary of Shetucket River
Date of Inspection:	7 November 1978

BRIEF ASSESSMENT

Taftville Reservoir No. 2 Dam is a zoned embankment about 667 ft. long with a concrete core wall, is 16 ft. wide at the crest, and has a maximum height of about 30 ft. It has a combined drop inlet spillway and outlet tower structure. The outfall from the drop inlet is a 16 in. dia. pipe and the outlet pipe is 12 in. dia. A trapezoidal notch in the crest of the dam serves as an auxiliary spillway. Maximum storage capacity of the reservoir is 110 acre-feet and the drainage area is 69 acres. On the date of inspection the facility was disused and the reservoir was empty, but until the spring of 1978 the dam was operated as a water supply facility for the City of Norwich, which still owns it.

Based on both height and storage capacity, Taftville Reservoir No. 2 Dam is classified as a small dam. There are no homes in the stream valley floor below the dam. There is an interchange on the Connecticut Turnpike, however, about a mile from the dam at the point where the stream empties into the Shetucket River, which could sustain damage from a large spill. The dam has therefore been classified as having a significant hazard potential.

The dam appears to be in good condition. The crest and downstream slope are covered with brush growth and there is some local displacement of rock fill and riprap. The outlet tower structure has been subject to vandalism, including demolition and removal of the concrete block tower house. Previous inspection reports noted seepage at the toe of the embankment near the 16 in. dia. spillway outfall pipe, but with the reservoir empty no seepage was evident on the date of this inspection.

The drop inlet and auxiliary spillways are together adequate to pass the selected test flood of ½ PMF without overtopping the dam.

Within two years after receipt of this Phase I Inspection Report, the owner, the City of Norwich, should implement the recommendations summarized below:

1. If the owner intends to reactivate the dam, the services of a registered professional engineer should be retained to make further investigations, design any necessary repair and remedial works, supervise construction and monitor the dam while the reservoir is being filled.

2. If the owner decides to abandon the dam permanently, the dam should be breached and the concrete outlet tower demolished. This work should be specified and supervised by a registered professional engineer.

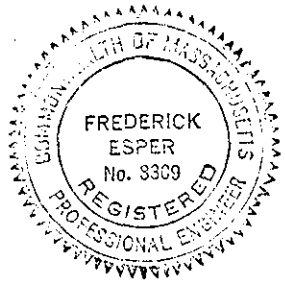
The owner should also implement the following measures:

1. If the dam continued to be disused but is not breached, regular surveillance is required to check that the outlet pipe is functioning to keep the reservoir drained. Guard-rails and/or fencing should be installed to prevent access to the unprotected outlet tower and bridge and to prevent persons falling from them.

2. If the dam is reactivated, (a) brush should be removed from the dam crest and downstream slope, (b) displaced riprap on both slopes should be replaced, (c) the downstream toe should be monitored for seepage during periods of high reservoir level, (d) procedures should be instituted for a biennial periodic technical inspection, (e) formal operation procedures should be instituted, and (f) a formal surveillance and warning plan should be developed.

Peter B. Dyson
Project Manager

Frederick Esper
Vice President



This Phase I Inspection Report on Taftville Reservoir No. 2 Dam has been reviewed by the undersigned Review Board members. In our opinion, the reported findings, conclusions, and recommendations are consistent with the Recommended Guidelines for Safety Inspection of Dams, and with good engineering judgment and practice, and is hereby submitted for approval.

JOSEPH W. FINEGAN, JR., MEMBER
Water Control Branch
Engineering Division

CARNEY M. TERZIAN, MEMBER
Design Branch
Engineering Division

JOSEPH A. MCELROY, CHAIRMAN
Chief, NED Materials Testing Lab.
Foundations & Materials Branch
Engineering Division

APPROVAL RECOMMENDED:

JOE B. FRYAR
Chief, Engineering Division

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test Flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aid in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

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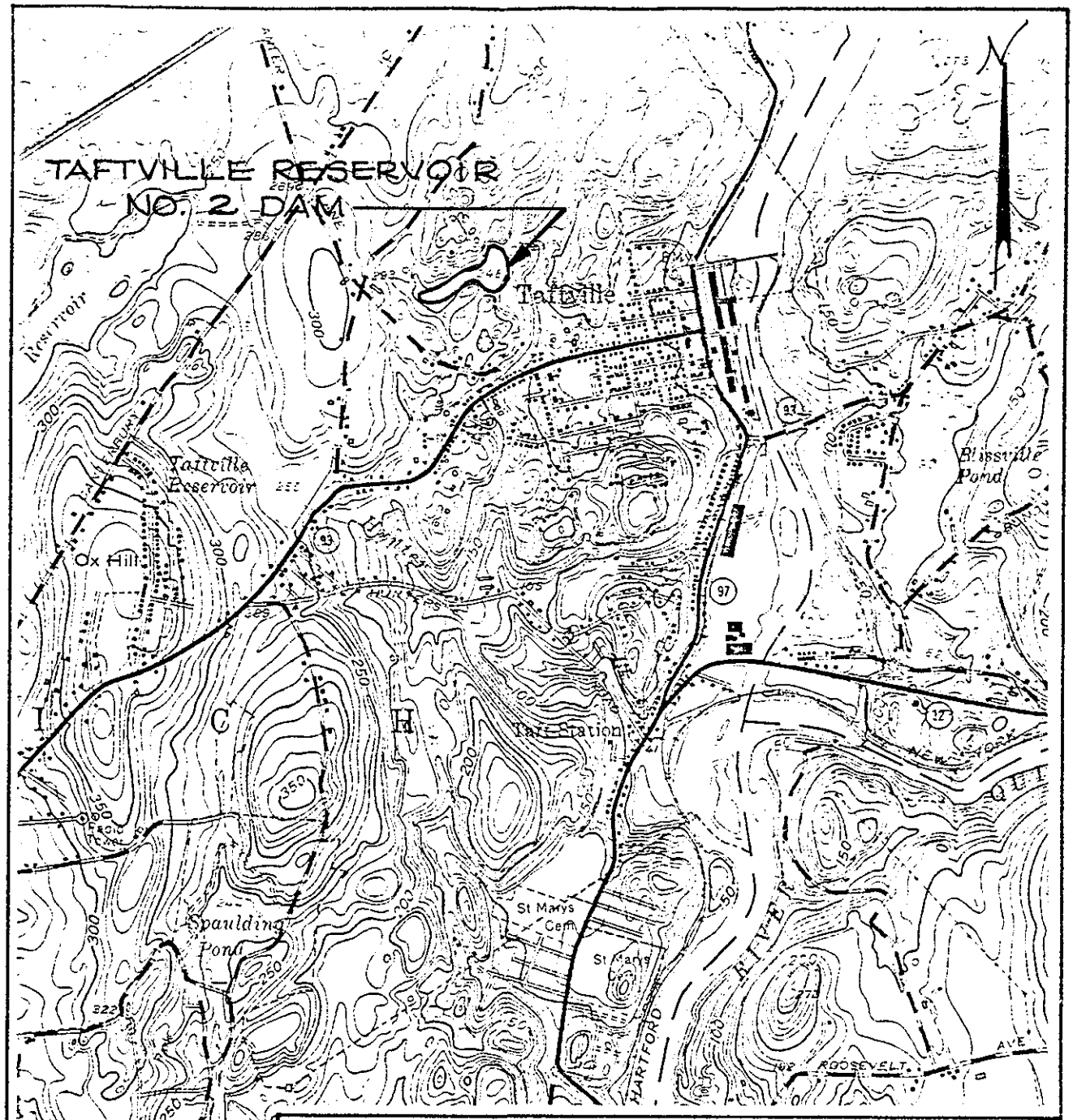
Overview from right abutment.



LOUIS BERGER & ASSOC., INC WELLESLEY, MASS. ARCHITECT · ENGINEER	U.S. ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS.

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

TAFTVILLE RESERVOIR NO. 2 DAM

NORWICH, CT. QUADRANGLE

THAMES RIVER BASIN **STATE - CT.**

			SCALE 1:24000
			DATE

PHASE I INSPECTION REPORT

TAFTVILLE NO. 2 DAM CT 00201

SECTION 1 - PROJECT INFORMATION

1.1 General

a. Authority

Public Law 92-367, August 8, 1972, authorized the Secretary of the Army, through the Corps of Engineers, to initiate a national program of dam inspection throughout the United States. The New England Division of the Corps of Engineers has been assigned the responsibility of supervising the inspection of dams within the New England Region. Louis Berger & Associates, Inc. has been retained by the New England Division to inspect and report on selected dams in the State of Connecticut. Authorization and notice to proceed was issued to Louis Berger & Associates, Inc. under a letter of 27 October 1978 from Max B. Scheider, Colonel, Corps of Engineers. Contract No. DACW33-78-C-0371 Job Change No. 1 has been assigned by the Corps of Engineers for this work.

b. Purpose

1. Perform technical inspection and evaluation of non-Federal dams to identify conditions which threaten the public safety and thus permit correction in a timely manner by non-Federal interests.

2. Encourage and assist the States to initiate quickly effective dam safety programs for non-Federal dams.

3. Update, verify and complete the National Inventory of Dams.

1.2 Description of Project

a. Location

Taftville Reservoir No. 2 Dam is located at the headwater of a mile long unnamed tributary stream which empites into the Shetucket River, itself a tributary of the Thames River, in New London County, Connecticut. The dam is on the western outskirts of the community of Taftville about 1,500 ft. north of

State Highway No. 93. The dam was originally built about 1910 for the Ponemah Mills and furnished water to the Taftville area. It is now owned by the City of Norwich. Use of the reservoir has now been discontinued and the reservoir lies empty.

b. Description of Dam and Appurtenances

1. Dam

Taftville Reservoir No. 2 Dam is a zoned embankment with a concrete core wall having a crest length of approximately 667 ft. at crest elevation 251.5 MSL. The crest width is 16 ft. The dam has a maximum height of about 30 ft. measured from ground surface, and a maximum of about 42 ft. measured from the bottom of the concrete core wall trench excavated below original ground surface. The embankment central zones on each side of the vertical core wall are gravel fill. The outer shell zones are rock fill of thicknesses varying from 2 ft. at crest level to about 4 ft. at the ground surface. These fills are indicated on the drawings as "riprap". The riprap on the upstream face is laid on a 2 to 1 slope; the downstream face riprap is on a 1½ to 1 slope.

The central core wall is 3 ft. thick for most of its height and extends to within 2.5 ft. of the crest of the dam. The core wall is founded on a broadened base within the cutoff trench, with widths of up to 8 ft. The cutoff trench was excavated to depths of up to 20 ft. and contacted bedrock for all but about 167 ft. of the length of the dam. Where bedrock was not reached the foundation is described as tight gravel, boulders tightly embedded in clay, clay, and blue gravel.

2. Spillway and Outlet Structure

A combined drop inlet spillway and outlet tower structure is located near the upstream toe of the dam about 125 ft. to the right of the left abutment. The concrete tower measures 8 ft. by 13 ft., with walls of 2 ft. thickness. The tower is divided into two shafts, of which the left 4 ft. by 4 ft. well constitutes the drop inlet for a service spillway, and the right 3 ft. by 4 ft. well provides for inlets to the outlet pipe. Seven ports, about 2 ft. square and evenly spaced along the tower, are cut through the wall facing the reservoir. Copper mesh screens are installed on the inner faces of the inlet ports.

At the drop inlet shaft, the tops of the front and left side walls are carried to elevation 248, to form the overflow crests for the spillway. The front crest opening is about 3.4 ft. long, the side crest opening is 4 ft. long, and wide-spaced vertical trash bars are placed at both spillway openings.

Pipes lead from the base of this structure through the dam to provide outfalls from the drop inlet and outlet wells. A 16 in. dia. cast iron pipe leads to a headwall at the downstream toe of the dam on a 4.6 percent grade, where it discharges into the stream bed. A 12 in. dia. cast iron outlet pipe takes off from the inlet well and continues down the valley to the site where a chlorinating house is located. A valve control is located between the dam and the chlorinating house.

3. Auxiliary Spillway

About 250 ft. to the right of the left abutment of the dam, a trapezoidal notch has been formed at the crest of the dam to serve as an auxiliary spillway. The notch sill is 18 in. lower than the crest of the dam, its bottom width is 15 ft. and its top width is 25 ft. Ledge rock is exposed downstream from the dam opposite the notch and flows would be directed over this exposed bedrock.

c. Size Classification

Taftville Reservoir No. 2 Dam is about 30 ft. high above downstream toe level, impounding a maximum of about 68 acre-ft. of storage to spillway crest level and about 110 acre-ft. to top of dam. In accordance with the Recommended Guidelines for Safety Inspection of Dams, the project falls into the small category on the basis of both storage capacity and height, and has therefore been so classified.

d. Hazard Classification

A breach failure of Taftville Reservoir No. 2 Dam would release water down the small tributary stream flowing north for about 1 mile, where it would then empty into the Shetucket River. There is no habitation in the valley floor which the stream would traverse, and hazard to life and property owing to a large spill through the valley would be negligible. However, interchange No. 83 of the Connecticut Turnpike (State Route 52) crosses the stream near the point

where it joins the Shetucket River, and damage to that facility could result from a large flow under the overpasses. Consequently, Taftville Reservoir No. 2 Dam has been classified as having a significant hazard potential in accordance with Recommended Guidelines for Safety Inspection of Dams.

e. Ownership

The dam was originally built by the Ponemah Mills about 1910 to supply water for their mill operation and to furnish water to the Taftville area. The reservoir facility was later purchased by the City of Norwich Public Utilities Department to augment their water supply. The reservoir is now in disuse and is kept empty.

f. Operator

Mr. Gregory J. Kuchy
Water and Sewer Division Manager
Department of Public Utilities
34 Shetucket Street
Norwich, CT 06360

Telephone: (203) 887-2555

g. Purpose of Dam

The Taftville Reservoir No. 2 Dam was originally constructed to supply water to the Taftville area. The facility was later purchased by the City of Norwich to augment their water supply system. Use of the reservoir has now been discontinued.

h. Design and Construction History

The dam was designed about 1910 by C. E. Chandler and S. B. Palmer, Engineers, Norwich, Connecticut, for the Ponemah Mills, to furnish water for mill operations and water supply in the Taftville area. A layout drawing of the reservoir and dam is included in Appendix B. No design or construction reports or records other than this layout drawing have been retrieved.

i. Normal Operating Procedure

The reservoir is disused and kept empty.

1.3 Pertinent Data

a. Drainage Area

The drainage area contributing to the Taftville Reservoir No. 2 encompasses about 69 acres, situated at the headwater of a small valley which parallels the Shetucket River about ½ mile to the east. The normal reservoir storage level is at elevation 248 MSL. The Shetucket River into which the tributary valley empties is about about elevation 50. Drainage into the reservoir is off the high hills to the west and north, which crest at about elevation 300. The average width of the drainage area from the reservoir to the hillcrests is about 1,000 ft., with hillside slopes averaging about 5 percent. The drainage area is of almost round shape, measuring about 2,000 ft. in diameter. The reservoir area is about 15 percent of that of the drainage area.

b. Discharge at Damsite

1. Outlet Works Conduit

Discharge of stored waters at Taftville Reservoir No. 2 Dam is provided through a 12 in. dia. outlet pipe, with valve control in the pipeline downstream from the dam. The invert of the inlet to the outlet pipe is at elevation 219, or about 32 ft. below the top of the dam. Computed capacity of this outlet is about 10 cfs. with the reservoir at normal storage level. A table of computed head-discharges is shown on Sheet D-1 in Appendix D.

2. Maximum Known Flood at Damsite

No records have been kept of past flood inflows into the reservoir, and there are no records to show whether spills have occurred through the spillways. The service spillway capacity with the reservoir to the sill of the auxiliary spillway is about 33 cfs. The capacity of the auxiliary spillway with reservoir level to the top of the dam is about 100 cfs. Spillway capacities are tabulated on Sheet D-2 in Appendix D.

c. Elevation (ft. above MSL)

1. Top of dam - 251.5
2. Maximum pool-design discharge - 250
3. Service spillway crest - 248
   Auxiliary spillway crest - 250
4. Diversion pipe invert - 218
5. Streambed at centerline of dam - 216

d. Reservoir

1. Length of pool at top of dam - 1,350 ft.
2. Length of pool at normal storage - 1,200 ft.
3. Average width of pool - 250 ft.

e. Storage (acre-feet)

1. At normal storage pool - 68
2. At design surcharge (El 250) - 87
3. At top of dam - 110

f. Reservoir Surface (acres)

1. Top of dam - 16.8
2. At design surcharge pool (El 250) - 12.8
3. At service spillway crest - 6.7

g. Main Dam

1. Type - Zoned embankment
2. Length - 667 ft.
3. Hydraulic height - 30 ft. (Structural height - 42 ft.)
4. Top width - 16 ft.
5. Side slopes - 2 to 1 upstream; 1½ to 1 downstream
6. Zoning - Concrete core wall, gravel inner zone, rockfill outer shell
7. Impervious core - Concrete core wall to bedrock over 75 percent of length of dam, core wall carried to 2½ ft. below top of dam
8. Cutoff -Core wall in trench excavated up to 20 ft. deep below ground surface
9. Grout curtain - None

h. Service Spillway

1. Type - Drop inlet
2. Length of weir - 7.33 ft.
3. Crest elevation - 248
4. Ungated
5. Downstream channel - 16-in. dia. CI pipe
6. General - Drop inlet crest control to reservoir elevation ± 249.5. Outfall pipe control for heads above that level.

i. Auxiliary Spillway

1. Type - Notch through crest of dam
2. Length of weir - 15 ft. at sill; 25 ft. at crest of dam
3. Crest elevation - 250
4. Ungated
5. Downstream channel - Flow directed onto exposed ledgerock slope

j. Regulating Outlets

1. Invert - Elevation 219
2. Size - 12 in. dia. pipe
3. Description - Inlet tower with inlet ports spaced at various levels, copper mesh screens. Outlet pipe 12-in. dia. pressure pipe leading to chlorinating house. Free discharge into stream at chlorinating house.
4. Control mechanism - Slide gate at outlet pipe entrance. Control valve in line between dam and chlorinating house.

SECTION 2 - ENGINEERING DATA

2.1 Design

A layout drawing of the dam and appurtenances built in 1910 shows only sketchy details (Appendix B). The design engineers were C. E. Chandler and S. B. Palmer of Norwich, Connecticut. No design data were retrieved.

2.2 Construction

No construction reports or histories of construction have been found.

2.3 Operation

The Taftville Reservoir No. 2 is now in disuse and maintained empty. No operation or maintenance reports are available and presumably none have been prepared.

2.4 Evaluation

a. Availability

Insufficient engineering data is available for an assessment to be made of the safety of the embankment.

b. Adequacy

Without adequate engineering data, a definitive review and assessment of this dam is not possible. The evaluation is based primarily on the visual observations of the inspection team and engineering judgment.

c. Validity

The validity of such engineering data as has been acquired is considered acceptable and is not challenged.

SECTION 3 - VISUAL INSPECTION

3.1 Findings

a. General

The visual inspection of the Taftville Reservoir No. 2 Dam took place on 7 November 1978. The reservoir was empty, and it appears that there has been little recent surveillance of the site by the owner. Some acts of vandalism were noted, including destruction of the gatehouse on top of the intake tower, but the dam and appurtenant structures still appear to be generally serviceable and in good condition.

b. Dam

The dam is constructed on a north-south arching alignment between two anchoring rock outcrops at the abutments. The upstream and downstream rockfill slopes are in generally good condition (Overview Photo). Brush growth on the crest and slopes is beginning to take serious hold and some downslope displacement of the downstream face, consisting of rather small stone, is locally evident. Opposite the inlet structure, the downstream slope displays severe erosion and sloughing. A well-worn footpath or motorcycle trail exists along the crest.

A seepage condition was noted in previous reports at the downstream toe of the dam near the exit point of the 16-in. dia. spillway outfall pipe (Appendix B). With the reservoir empty at the time of the inspection, this seep was not in evidence.

c. Appurtenant Structures

The outside of the drop inlet spillway and outlet works intake tower was visible in its entirety owing to the reservoir being empty (Appendix C, Photo No. 1). The concrete appeared to be in good condition. The tower house built of concrete block has been dismantled by vandals, and the material has been hauled away. The floor plate covering the tower wells cannot be removed because vandals have beaten the nuts holding the plate so that they cannot be loosened. Some of the vertical trash bars at the drop inlet spillway crests are missing. The copper mesh screens at the back of the inlet ports of the outlet structure well have fallen off and can be seen through the ports lying at the bottom of the tower well. With the removal of the tower house, there are

no safeguards at the edges of the tower, nor are there handrails along the access bridge. Being the object of vandalism, the tower represents a special danger to trespassers.

The 12 in. dia. outlet pipe valve is kept partly open at all times to keep the reservoir empty. Without constant surveillance this valve could become the target of vandals and the inlet pipe could become clogged. To minimize this risk, the valve should be kept fully open. There is no visible evidence that the 16 in. dia. spillway outfall has been in service (Appendix C, Photo No. 2).

The auxiliary spillway is a swale about 18 in. lower than the dam crest at about mid-length, which discharges into a bouldered channel now overgrown with saplings (Appendix C, Photo Nos. 3 & 4).

d. Reservoir Area

The reservoir is empty and most of the bottom is exposed. A considerable amount of the bottom consists of bare rock outcrops and low-lying areas are now mud flats. Since use of the reservoir was abandoned only recently, vegetation has not had a chance to reestablish itself in the soil covered areas. The banks of the reservoir also show many rock outcrops and appear to be quite stable.

e. Downstream Channel

As noted in Section 1.2d, there appear to be few if any habitations in the mile-long valley to the point where it empties into the Shetucket River. The channel is on a steep gradient and is being invaded by heavy brush and tree growth. The waterway passages under Interchange No. 83 of the Connecticut Turnpike (Route 52) may not be sufficient to withstand a large flood surge, but any such surge would be considerably diminished in traversing the mile-long valley between the dam and the interchange. A rough estimate of valley storage for a flood depth of about 5 or 6 ft. gives a volume of about 100 acre-ft., the equivalent of the storage in the reservoir to the top of the dam (see Section 5).

3.2 Evaluation

The visual inspection of the dam, although carried out while the reservoir was empty, has revealed sufficient information to permit an assessment to be made of those features relating to the stability and integrity of the structure. The dam is judged to be in generally good condition.

With lack of maintenance and surveillance because the facility is now disused, gradual deterioration and vandalism may render the outlet pipe and valve unserviceable, with the result that emptying or controlling the storage in the reservoir may become difficult. If the facility is to be permanently abandoned, the safest recourse would be to breach the dam so that storage could not accumulate.

SECTION 4 - OPERATIONAL PROCEDURES

4.1 Procedures

The Taftville Reservoir No. 2 Dam is operated by personnel of the Water and Sewer Division, Department of Public Utilities, City of Norwich. The reservoir is disused and is kept empty by leaving the outlet valve partially open at all times. No documented operating procedures have been prepared.

4.2 Maintenance of Dam

It is understood that use of the facility was abandoned and the reservoir was drained in the spring of 1978, because the owner lacked sufficient resources to provide adequate maintenance and surveillance to prevent vandalism. It appears from previous inspection reports in 1963, 1967 and 1969 (Appendix B) that in earlier years routine maintenance was adequate.

4.3 Maintenance of Operating Facilities

The operating facilities are not being maintained and are being vandalized by trespassers.

4.4 Warning System

There is no formal warning system for this dam.

4.5 Evaluation

The dam is now disused and the reservoir is kept empty. A formal procedure for checking periodically that the 12 in. dia. outlet valve is fully open and the outlet pipe is clear and functioning should be implemented. If the facility should ever be put into operation again, operational and maintenance procedures, and surveillance and warning systems, should be formalized and put into writing.

SECTION 5 - HYDRAULIC/HYDROLOGIC

5.1 Evaluation of Features

a. Design Data

1. Drainage Area

The drainage area of Taftville Reservoir No. 2 is at the headwater of a small tributary valley emptying into the Shetucket River, encompassing an area of only 69 acres. Since the hillside slopes surrounding the reservoir are steep and only extend about 1,000 ft. from reservoir to crest of the divide, runoff from rainfall will be rapid. The drainage area is thickly wooded.

2. Reservoir Area and Capacity

For determining the reservoir areas and capacities of Taftville Reservoir No. 2, planimetered areas were taken from contours of the reservoir delineated on the layout drawing in Appendix B. For determining surcharge storage, planimetered areas from the USGS 2,000 ft. per in. quadrangle sheet were measured. The reservoir has an area at normal storage of about 6.7 acres. Area-capacity tables showing total storage and surcharge storages for use in flood routings are shown on Sheet D-1, Appendix D.

3. Flood Hydrology

The test flood chosen to evaluate the hydraulic and hydrologic features of Taftville Reservoir No. 2 Dam was selected in accordance with the recommendations presented in Recommended Guidelines for Safety Inspection of Dams. Since this dam is classified as small in size with a significant hazard potential, a test flood with a magnitude corresponding to a ½ PMF was selected as being appropriate for the evaluation.

Probable Maximum Precipitation (PMP) data were obtained from Hydrometeorological Report No. 33, which for the Connecticut area approximates 24.3 in. of 6-hour point rainfall over a 10 square mile area. This value was then reduced by 20 percent to allow for basin size, shape and fit factors. The 6-hour rainfall duration curve of a total of 19.2 in. was then distributed and rearranged as suggested in Design of Small Dams. A constant infiltration loss of 0.1 in. per hour was deducted from the

precipitation values to give the excess rainfall amounts used to prepare an inflow hydrograph. These values are tabulated on Sheet D-5, Appendix D.

Because of the small drainage area with steep slopes and short water courses, no lag time was assumed and instantaneous runoff was taken from direct precipitation on the area. Tabulated values are given on Sheet D-5. The resulting hydrograph for a full PMF is shown on Figure 1, Sheet D-6, Appendix D.

Both the PMF and 0.5 PMF were routed through the reservoir and spillways. It was assumed that, at the start of the flood event, either the reservoir was empty or at normal storage level. Tabulated below are the results of these routings.

Flood Magnitude	Max. Reservoir Water Surface Elevation	Maximum Discharges				
		Thru Outlet Pipe cfs.	Thru Service Spillway cfs.	Thru Auxil. Spillway cfs.	Over Dam cfs.	Combined Outflow cfs.
Reservoir Full at Start of Flood						
PMP	251.9	0	34	156	460	650
0.5 PMP	251.1	0	34	70	0	104
Reservoir Empty at Start of Flood						
PMP	250.6	11	33	24	0	68
0.5 PMP	245.4	10	0	0	0	10

On Figures 1 and 2, Sheet D-6 and D-7 in Appendix D, the flood routings are shown in graphical form.

It will be noted that for a PMF inflow, the dam would be overtopped about 0.4 ft. if the reservoir was at normal storage level at the start of the flood event. For a 0.5 PMF or lesser flood, the reservoir level would not rise to the top of the dam; the freeboard would be at least 0.4 ft.

b. Experience Data

No records are available in regard to past operation of the reservoir or of surcharge encroachments and flows through the spillway. The maximum past inflows are not known.

c. Visual Observations

There is no visible evidence in the downstream valley channel to indicate that releases have ever been made through the service spillway. Similarly, there is no evidence that water was ever released through the unlined auxiliary spillway.

d. Overtopping Potential

Based on the selected test flood of ½ PMF, as noted in Para. a. above, even with the reservoir full to normal storage at the start of the flood, the surcharge storage capacity is sufficient to accommodate the inflow and leave a freeboard to top of dam of about 0.4 ft. On this basis, the threat of an overtopping of the dam owing to a test flood event would not materialize.

e. Drawdown Capacity

Drawdown of the reservoir is only possible through the 12-in. outlet pipe. For evacuating the reservoir to the invert of the outlet pipe, an average release of about 8.6 cfs. could be discharged. On this basis a period of about 4 days would be required to release the 68 acre-ft. in the reservoir, assuming no inflows in the interim.

f. Downstream Hazard Potential

It is to be noted that the dam has a concrete core wall extending the entire length of the dam, from bedrock to within 2.5 ft. of the top. If piping or sloughing developed in the dam, it would be expected that a washout would be gradual and it is unlikely that a sudden breach could develop from this cause.

If it were to be envisioned that a sudden breach could occur with the reservoir full to normal storage level, and assuming a gap with a 20 ft. bottom width at stream level and 1.4 to 1 slopes, an initial discharge of about 17,000 cfs. could be released. As shown on Sheet D-8 of Appendix D, that outflow would diminish to about 7,200 cfs. in 3 minutes and the entire 68 acre-ft. of reservoir storage would empty in

about 7.5 minutes. The outflow would result in an average stage of about 5 ft. depth in the downstream valley, with an outflow at the confluence with the Shetucket River of about 2,000 cfs.

As noted in Section 1.2d and Section 3.1e, it appears that hazard to life and property from major outflows from Taftville Reservoir No. 2 Dam would be small. It is conceivable that the Interchange No. 83 of the Connecticut Turnpike (Route 52) might sustain some damage from the outflow due to a sudden breach in the dam. It is concluded that the dam does not appear to pose any major risks to downstream interests other than the Connecticut Turnpike.

SECTION 6 - STRUCTURAL STABILITY

6.1 Evaluation of Structural Stability

a. Visual Observation

The field investigations of the embankment revealed no significant displacement or distress which would warrant the preparation of slope stability computations based on assumed soil properties and engineering factors.

While the embankment of the dam appears to be in good condition, no definitive evaluation can be made on the basis of observations made when the reservoir was empty.

Rockfill or riprap on both sides of the dam has settled in several locations, and the auxiliary spillway and its outlet channel are both ill-defined and insufficiently armored. Saplings and brush are beginning to overrun the dam.

b. Design and Construction Data

The dam was built in 1910. The original plan shows the dam to be provided with a concrete core wall 8 ft. wide at the base and 3 ft. at the top, which is 2.5 ft. below the crest. The core wall extends, as a cut-off, through "clay" or "tight gravel" (probably glacial till) into bedrock. Some sections show an 8 ft. wide vertical zone of "clay and gravel" immediately downstream of the core wall, with the remainder of the downstream fill shown as "rocks" on 1½ to 1 slope. Elsewhere, the downstream embankment is designated as clay and gravel fill, with riprap shell, and the upstream embankment as "puddled fill" on 2 to 1 slope, with a 2 ft. thick riprap shell.

Despite the somewhat unconventional design, the dam appears to have performed satisfactorily throughout its history, although there is documentation in several 1969 reports of leakage around the waste pipe.

c. Operating Records

The dam is now inoperative. No pertinent operating records appear to exist.

d. Post Construction Changes

It is inferred from records that periodic repairs have been made, mostly to the intake structure, subsequent to construction and prior to abandonment. These have had no effect on the stability of the embankment.

e. Seismic Stability

The dam is located in Seismic Zone No. 1, and, in accordance with Phase I guidelines, does not warrant seismic analyses.

SECTION 7 - ASSESSMENT, RECOMMENDATIONS & REMEDIAL MEASURES

7.1 Dam Assessment

a. Condition

On the basis of the Phase I visual examination, Taftville Reservoir No. 2 appears to be in generally good condition, except for lack of routine maintenance and certain relatively recent damage by vandalism to the appurtenant structures.

The reservoir is now empty, and it is understood that it is not the intention of the operators to utilize its storage capacity for water supply purposes at the present time.

b. Adequacy of Information

The information recovered is considered adequate for the purpose of making an assessment of the general condition of the dam with respect to safety. A more definitive assessment of the performance of the dam cannot be made on the basis of observations made when the reservoir was empty.

c. Urgency

The recommendations and remedial measures enumerated below should be implemented by the owner within two years after receipt of the Phase I Inspection Report.

d. Need for Additional Investigation

Additional investigations are required as recommended in Para. 7.2.

7.2 Recommendations

If the owner intends to reactivate the dam and again utilize the reservoir for water supply purposes at some foreseeable future time, it is recommended that the services of a competent registered professional engineer be retained before the reservoir is filled. The engineer should make further investigations and design any necessary repair and remedial works to the dam and appurtenant structures, which should be carried out by a qualified contractor before the reservoir is filled. As the reservoir is filled, the engineer should perform periodic technical inspections of the dam and appurtenant works, and the owner should implement his recommendations for any remedial work deemed necessary.

If the owner intends to abandon the Taftville Reservoir No. 2 facility permanently or for the foreseeable future, it would be prudent to breach the dam and demolish the concrete outlet tower, so that there would be no need for maintaining the remaining structures. Breaching the dam would involve breaking out the concrete core wall. The procedures for this work should be specified by a registered professional engineer, and the demolition work should be carried out by a qualified contractor.

7.3 Remedial Measures

While the dam is disused and the reservoir is kept empty, there is a potential hazard to people trespassing on the property. It is impracticable to prevent access to the dam and reservoir area, which would require round-the-clock surveillance. To minimize the possibility of injury to persons falling from the unprotected outlet tower and bridge, or from exploring inside the tower chambers, the owner should install and maintain guardrails and other protective fencing to the tower and bridge.

Also, to minimize the risk of clogging the owner should open the 12 in. dia. outlet pipe valve fully.

If the dam is reactivated, the following measures should be carried out by the owner:

1. Remove all brush and saplings from crest, auxiliary spillway, and downstream slope of embankment, and keep future growth cut on a regular basis.

2. Replace displaced riprap/rockfill on both upstream and downstream slopes.

3. Monitor the downstream toe of the dam for possible seepage periodically during periods of high reservoir level and not less than once each year. Particular attention should be given to the area around the exit point of the 16 in. dia. spillway outfall pipe, where seepage was recorded on previous inspections.

a. Operation and Maintenance Procedures

If the dam is reactivated, the owner should institute procedures for a biennial periodic technical inspection of the dam and appurtenant works, with supplementary inspections of any suspect items. Formal operation procedures and a flood warning system should also be developed.

If the dam continues to be disused but is not breached, regular surveillance is needed to check that the outlet valve is fully open and that the outlet pipe is not clogged, and is functioning to keep the reservoir drained.

7.4 Alternatives

The only practical alternatives are discussed in Para. 7.2 above.

APPENDIX A

VISUAL INSPECTION CHECKLIST

VISUAL INSPECTION
PHASE I

Inspection No. CT 00201 Name of Dam: Taftville Reservoir No. 2

Date of Inspection: 7 November 1978

Weather: Cloudy, cool Temperature: 45°F ±

Pool Elevation at Time of Inspection: Reservoir empty

Tailwater Elevation at Time of Inspection: Not applicable

INSPECTION PERSONNEL

Pasquale E. Corsetti	Louis Berger & Associates, Inc.	Acting Proj. Manager
Carl J. Hoffman	Louis Berger & Associates, Inc.	Hydraulics, Structures
Thomas C. Chapter	Louis Berger & Associates, Inc.	Hydrology, Soils
James H. Reynolds	Goldberg Zoino Dunnicliff & Associates, Inc.	Soils

OWNER'S REPRESENTATIVES

Humphrey Leary	Norwich Dept. of Public Utilities	Water Superintendent
Gary Matylewicz	Norwich Dept. of Public Utilities	Utilities Engineer

VISUAL INSPECTION CHECK LIST

Identification No. CT 00201 Name of Dam: Taftville Reservoir No. 2 Sheet 1

VISUAL EXAMINATION OF	OBSERVATIONS AND REMARKS
EMBANKMENT Vertical alignment and movement	No movement evident.
Horizontal alignment and movement	No movement evident.
Unusual movement or cracking at or near the toe	None evident.
Surface cracks	None evident.
Animal burrows and tree growth	A few burrows noted. Extensive saplings and brush on d/s slope. Brush growth on crest.
Sloughing or erosion of slopes	Minor local erosion left of spillway near crest.
Riprap slope protection	Upstream and downstream slopes have riprap/rock-fill which is displaced locally.
Seepage	None evident (reservoir empty).

VISUAL INSPECTION CHECK LIST

Identification No. CT 00201 Name of Dam: Taftville Reservoir No. 2 Sheet 2

VISUAL EXAMINATION OF	OBSERVATIONS AND REMARKS
Piping or boils	None evident.
Junction of embankment and abutment, spillway and dam	Both abutments on bedrock, no problems evident.
Foundation drainage	None evident.
OUTLET WORKS Approach channel	None.
Outlet conduit concrete surfaces	None.
Intake structure	Tower structure, condition good. Gatehouse demolished.
Outlet structure	16 in. dia. pipe under dam.
Outlet channel	N/A

VISUAL INSPECTION CHECK LIST

Identification No. CT 00201 Name of Dam: Taftville Reservoir No. 2 Sheet 3

VISUAL EXAMINATION OF	OBSERVATIONS AND REMARKS
Drawdown facilities	12 in. dia. pipe with valve between dam and chlorinating house.
SPILLWAY STRUCTURES Concrete weir	4'6" and 4'3" sills to drop inlet shaft in outlet tower.
Approach channel	None.
Discharge channel	Natural stream, heavily wooded, steeply sloping.
Stilling basin	None.
Bridge and piers	None.
Control gates and operating machinery	Outlet gate inaccessible, probably a gate valve.

VISUAL INSPECTION CHECK LIST

Identification No. CT 00201 Name of Dam: Taftville Reservoir No. 2 Sheet 4

VISUAL EXAMINATION OF	OBSERVATIONS AND REMARKS
INSTRUMENTATION Headwater and tailwater gages	None.
Embankment instrumentation	None.
Other instrumentation	None.
RESERVOIR Shoreline	Moderate slopes, heavily wooded.
Sedimentation	None.
Upstream hazard areas in event of backflooding	None.
Alterations to watershed affecting runoff	None.

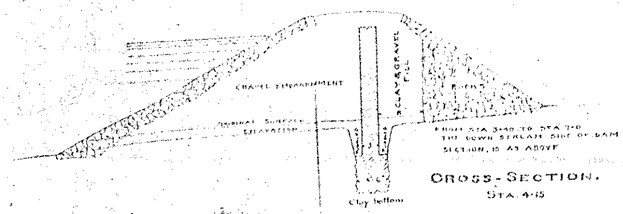
VISUAL INSPECTION CHECK LIST

Identification No. CT 00201 Name of Dam: Taftville Reservoir No. 2 Sheet 5

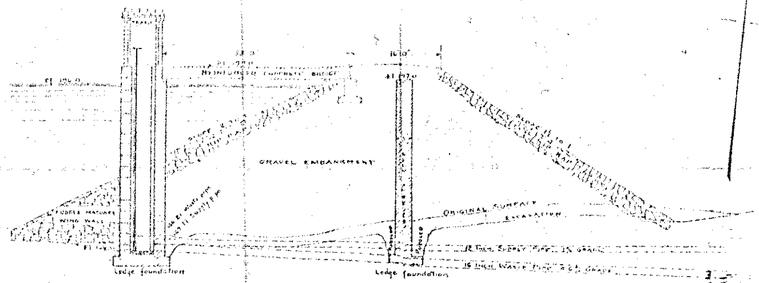
VISUAL EXAMINATION OF	OBSERVATIONS AND REMARKS
DOWNSTREAM CHANNEL Constraints on operation of dam	None.
Valley section	Steeply sloping stream channel in heavy woods.
Slopes	Steep.
Approx. No. of homes/population	None.
OPERATION & MAINTENANCE FEATURES Reservoir regulation plan, normal conditions	Reservoir disused.
Reservation regulation plan, emergency conditions	N/A
Maintenance features	N/A

APPENDIX B

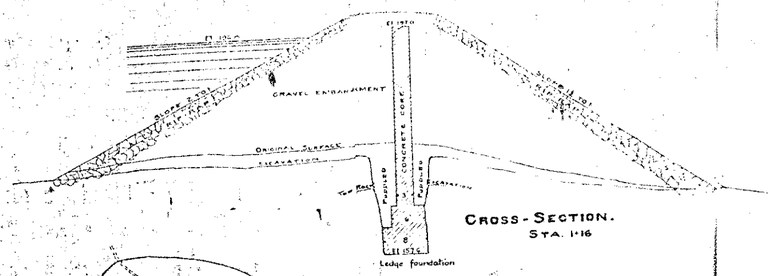
PLANS, RECORDS & PAST INSPECTION REPORTS



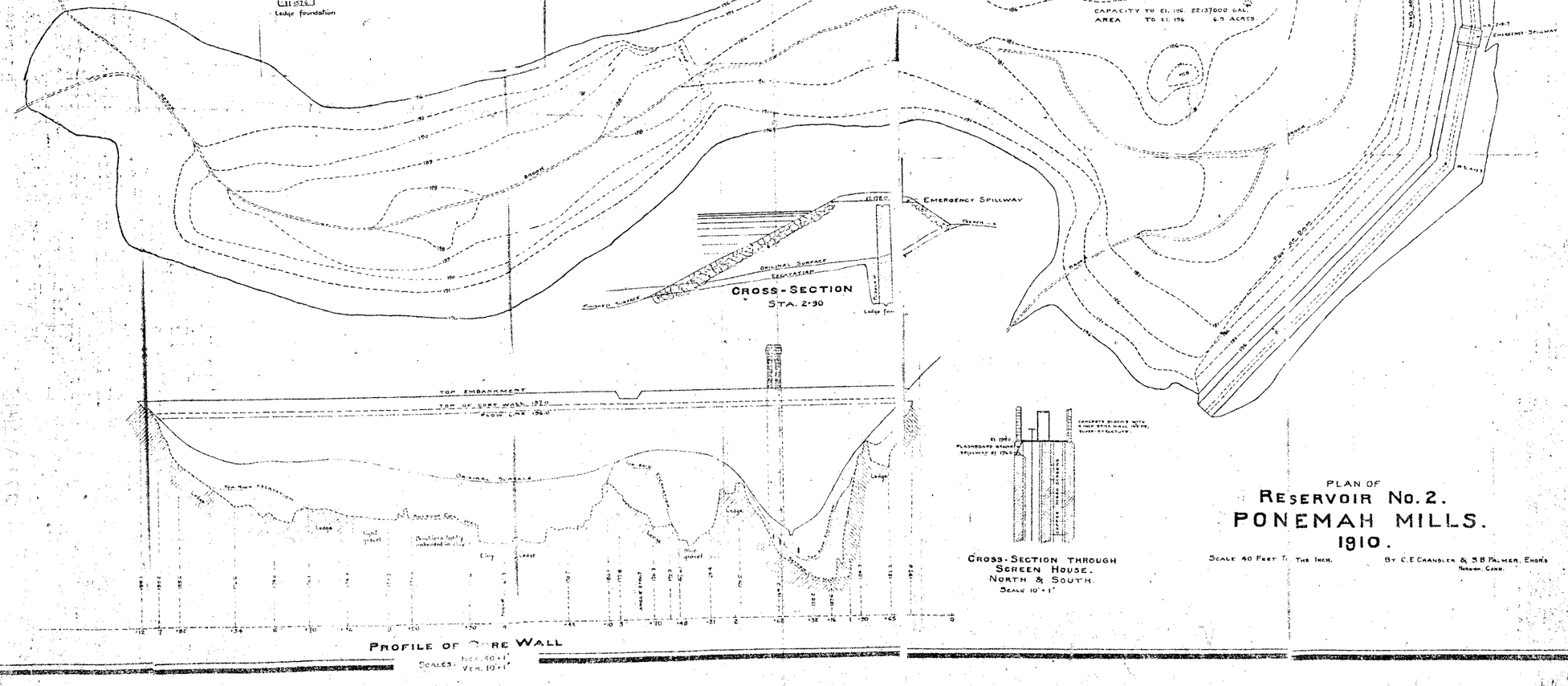
CROSS-SECTION.
STA. 4+15



CROSS-SECTION OF DAM.
STA. 1+62
SCALE 10'=1"



CROSS-SECTION.
STA. 1+16



PROFILE OF CORE WALL
SCALES: Hor. 40=1" Ver. 10=1"

CROSS-SECTION THROUGH SCREEN HOUSE. NORTH & SOUTH.
SCALE 10'=1"

PLAN OF
RESERVOIR No. 2.
PONEMAH MILLS.
1910.

SCALE 40 FEET TO THE INCH. BY C.E. CHANDLER & S.B. PALMER, ENGRS. NORWICH, CONN.

#13

April 16, 1963

Re: Dam #2 Taftville

Philip L. White
eral Manager
lic Utilities Department
wich, Connecticut

r Sir:-

I have recently inspected the dam #2 in the Taftville area. s was formerly owned by the Ponemah Mills and furnished water to Taftville area. It is now owned by the City of Norwich.

The dam is located in Taftville about 1500 feet North of vidence Street and about opposite Hunters Avenue. The dam is a g earth embankment about 650 feet long and a maximum height of haps 30 feet. Water is taken through a 12" C. I. pipe from here the Taftville water system. There is a 16" C. I. overflow pipe trolled from the intake structure. In addition there is a grass ilway that may be in service in emergencies. Pond was 2 feet below l pond on Saturday, April 13th. The drainage area of this pond dam is small and I judge from appearances that water goes to waste e very seldom. I assume it is normally a little below full pond. re are three reservoirs in the Taftville system so they can be hed together in some degree.

The dam has stone riprap on both the upstream and downstream e. It appears to be tight and in good condition.

The following work should be done on the dam:

A good many large trees have grown on the embankment. These create a real hazard, since if they blow over a hole is likely to result. All trees and brush must be removed in the vicinity of the dam. Some work has been done on this item but much remains to be done.

Some pointing on the cement block intake structure would be desirable. Some cracks are apparent.

I find the dam to be safe and in good condition. However, the ms mentioned above should be attended to promptly.

Very truly yours,

CHANDLER & PALMER

/ew
.: Mr. Emitt A. Dell

STATE OF CONNECTICUT

WATER RESOURCES COMMISSION

STATE OFFICE BUILDING · HARTFORD 15, CONNECTICUT

May 10, 1963

Not sent on request of Mr. White as he is in the process of repairing the Dam.

Mr. Philip L. White
General Manager
Public Utilities Department
Norwich, Connecticut

Dear Mr. White:

According to the records in this office the so-called Taftville #2 Dam in the Taftville area is under the ownership of the City of Norwich. (LOCATED ABOUT 1500 FT NORTH OF PROVIDENCE ST NEAR HUNTERS AVE

Section 25-110 of the 1958 Revision of the General Statutes places under the jurisdiction of this Commission all dams, "which, by breaking away or otherwise, might endanger life or property." The Commission finds that the failure of this dam would endanger life or property.

In accordance with Section 25-111 of the General Statutes this dam has been inspected and found to be in an unsafe condition. The statute states in part: . . . "If, after any inspection described herein, the commission finds any such structure to be in an unsafe condition, it shall order the person, firm or corporation owning or having control thereof to place it in a safe condition or to remove it, and shall fix the time within which such order shall be carried out."

F I N D I N G

Based on the engineers report covering the inspection of this dam the Water Resources Commission finds the structure to be in an unsafe condition. It also finds that certain repairs or alterations are necessary to place the structure in a safe condition.

The repairs or alterations to be made should include but are not necessarily limited to the following items:

1. Remove all trees and brush from the embankment.
2. Repair all cracks.
3. Repair intake structure.

O R D E R

In accordance with Section 25-111 of the General Statutes you are hereby ordered to make the repairs or alterations necessary to place the structure in a safe category or to remove the structure.

Any repairs or alterations to the structure or its removal shall be carried out in accordance with engineering plans and specifications prepared by a registered engineer and submitted to this Commission for approval and for the issuance of a permit prior to any construction or demolition work in accordance with Section 25-112 of the General Statutes.

The Commission shall be notified within two weeks what steps you plan to take to repair or remove the structure. The work shall be completed by September 15, 1963.

Very truly yours,

WATER RESOURCES COMMISSION

By_____
William S. Wise, Director

WSW:js

)HN J. MOZZOCHI AND ASSOCIATES
CIVIL ENGINEERS

GLASTONBURY, CONN. 06033
217 HEBRON AVENUE
PHONE 633-9401

PROVIDENCE, R. I. 02903
200 DYER STREET
PHONE GASPEE 1-0420

)HN J. MOZZOCHI
ASSOCIATES
)WEN J. WHITE
)HN LUCHS, JR.
OR L. GIOVANNINI

September 28, 1967

REPLY TO: Glastonbury

Mr. William P. Sander
Engineer - Geologist
State of Connecticut
Water Resources Commission
State Office Building
Hartford, Connecticut 06115

Re: Our File No. 57-73-83
City-Owned Dams
Norwich, Connecticut
TAFTVILLE #2
NORWICH

Dear Mr. Sander:

In response to your instruction of May 22, 1967, authorizing me to inspect the nine (9) dams owned by the City of Norwich, I eventually made an appointment through the General City Manager, Robert Grimshaw, to meet with the head of the Public Utility Department, Mr. Nystrom, and the Superintendent of the Water Department, Mr. Leary, and met with them on Tuesday, September 26th.

Of the nine dams concerned, two are operated by the Electric Power Department of Norwich and seven by the Water Department. The two power dams are low-head structures, one on the Shetucket River, called Occum Dam, which is a concrete-spillway type, and the second is a wood-crib type also on the Shetucket River at a section of Norwich known as Greenville. Both of these dams are in good condition and have had constant repairs since the city acquired them. On the Greenville Dam there is currently work going on repairing the down-stream apron. At the time of my inspection, everything that I could see appeared to be in good order at both dams.

In the order of their importance, the water reservoir dams are as follows:

Stoney Brook Dam, in Montville, rated at a 500 million gallon capacity;

Deep River Reservoir, in Colchester, rated at 385 million gallons;

Fairview Reservoir, in Norwich, rated at 450 million gallons;

Taftville #1 rated at 88 million gallons;

Taftville #2 rated at 22 million gallons;

Taftville #3 rated at about one million gallons;

Bog Meadow Dam, which has never been in use, has no exact quantity determined.

My observations of these dams showed that they have been well kept up with the exception of some minor work which could be easily accomplished through the normal maintainence program. I discussed these in detail with Mr. Leary at the time of my inspection and list them herewith:

On Stoney Brook there are several small growths of cedar trees on the dam itself which should be removed. The brush on the downstream side of the embankment should be cleared off and the turf cover could stand some fertilizing in order to create a little better growth.

The same maintenance program applies to the Deep River Reservoir.

Taftville #1 is in very good condition with the exception that there is one twin 12" oak tree in the embankment which should be removed.

Taftville #2 has to have trees cleared and brush removed as in the other cases.

Taftville #3 has not been used in some years and it needs a large amount of clearing of the dike because it has overgrown tremendously.

This also applies to Bog Meadow which has not been in use. It also has trees and brush to be removed; and, in addition, there should be some repair work done on the rip rap which has been displaced. At the corner of the masonry wall near the spillway some additional earth fill is required.

I requested that plans on all of these dams be furnished to us in order to build up a file in our office. It was discouraging to find an absolute lack of any information as to original construction. I have not been able to determine whether or not these can be obtained through the offices of Chandler and Palmer who appear to have been the consultants for the city throughout the years and, undoubtedly, have much of this information in their files. Perhaps you may be in a better position to contact them.

I think that this was the limit of my authorization to make the inspection. If there is a need for us to do any further checking of the capacity of spillways, checking of runoffs, etc., I believe a more extensive program of investigation would be required.

Very truly yours,

John J. Mozzochi

John J. Mozzochi and Associates
Civil Engineer

JJM/cd

STATE OF CONNECTICUT

WATER RESOURCES COMMISSION

STATE OFFICE BUILDING • HARTFORD, CONNECTICUT 06115

February 5, 1969

ıo to: File

m: William H. O'Brien III

ject: Taftville Res. #2 Dam - Norwich

On January 23, 1969, the undersigned inspected the subject dam in the company Mr. Humphrey Leary, Superintendent of the Town of Norwich Public Utilities artment. The following items were noted in this inspection:

1. Some of the rip-rap on the upstream side of the dam had settled and should be restored to its former level.

2. There is a low grassed area in the dam, apparently to serve as an emergency spillway. There is no defined channel leading from this low a rea, and there appears to be insufficient protection of the downstream toe, in the event of discharge through this spillway. The spillway capacity of this reservoir should be checked and correlated with the use of flashboards in the drop spillway.

3. The 12" supply line through the dam has no shut off on the upstream end.

4. Water was flowing around the waste pipe at the toe of the dam with water 4 feet below the spillway. This leakage should be checked again at full pond.

5. The cracks referred to in the Order were apparently in the brick inlet structure and have been repaired.

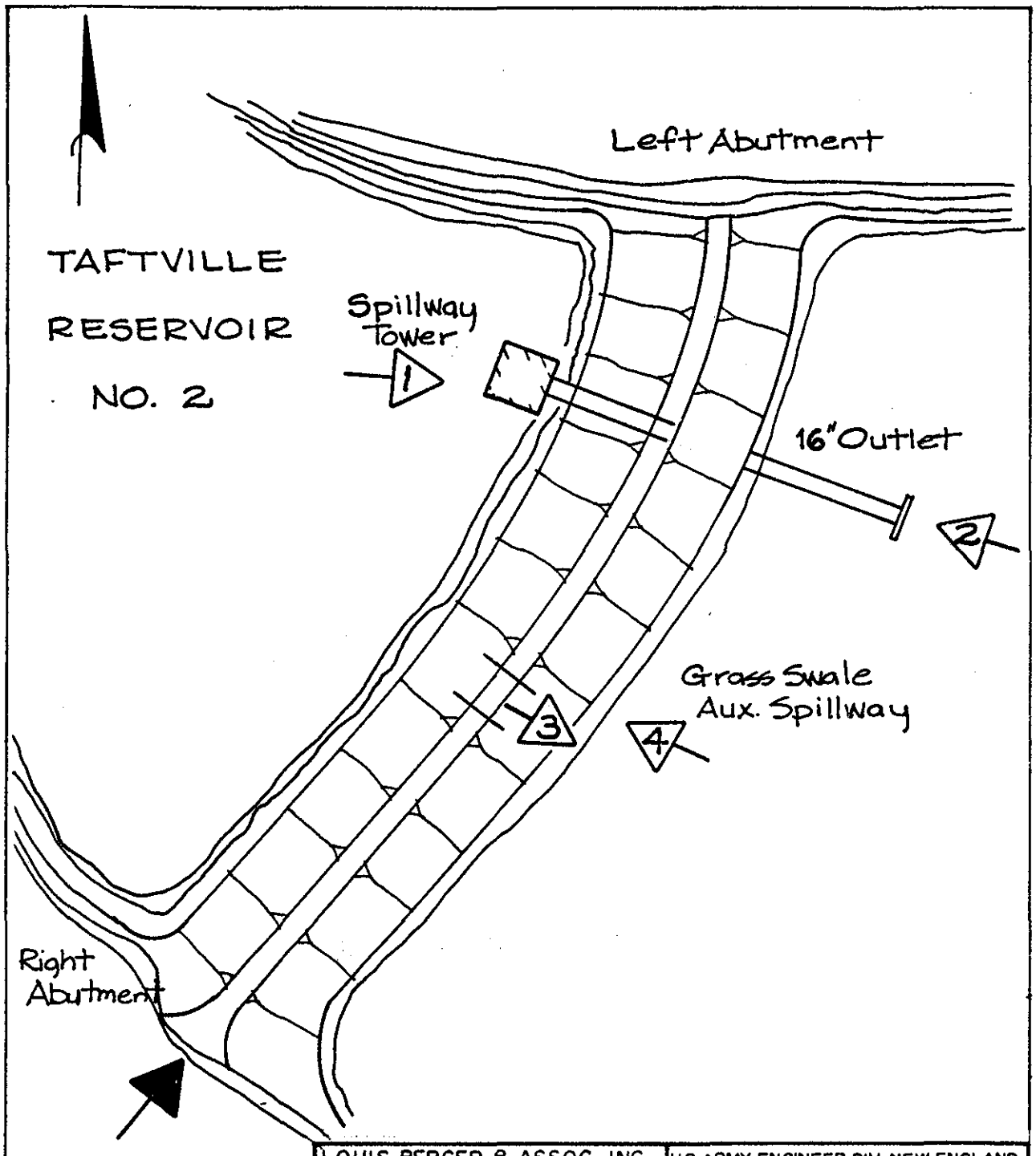
William H. O'Brien III

Civil Engineer

III:vhb

APPENDIX C

SELECTED PHOTOGRAPHS



LOUIS BERGER & ASSOC., INC WELLESLEY, MASS. ARCHITECT · ENGINEER	U.S. ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS.

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

TAFTVILLE RESERVOIR NO. 2 DAM

SKETCH PLAN SHOWING LOCATION & ORIENTATION OF PHOTOS

STATE - CT.

SCALE	1 : 24000
DATE	

TAFTVILLE RESERVOIR NO. 2 DAM

1. Tower with drop inlet spillway and outlet works intake.

2. 16 in. dia. spillway outfall pipe.

TAFTVILLE RESERVOIR NO. 2 DAM

3. Auxiliary spillway notch in crest.

4. Auxiliary spillway notch in crest.

APPENDIX D

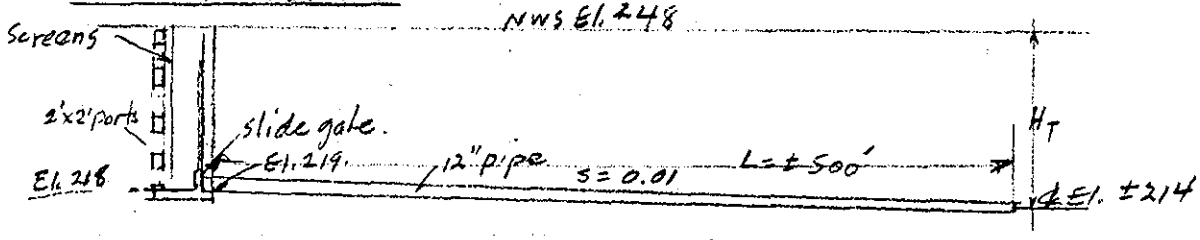
HYDROLOGIC & HYDRAULIC COMPUTATIONS

BY EJH DATE 12-21-78 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO. D-1 OF...

CHKD. BY ..... DATE ..... INSPECTION OF DAMS - CONN. & R.I. PROJECT .....

SUBJECT TAFTVILLE RESERVOIR NO 2 DAM - DISCHARGE CURVES

OUTLET WORKS



12" pipe $A = 1.0$ sq. ft. $\frac{fL}{D} = \frac{.03 \times 500}{1.0} = 15$

Entrance 0.5

Exit 1.0

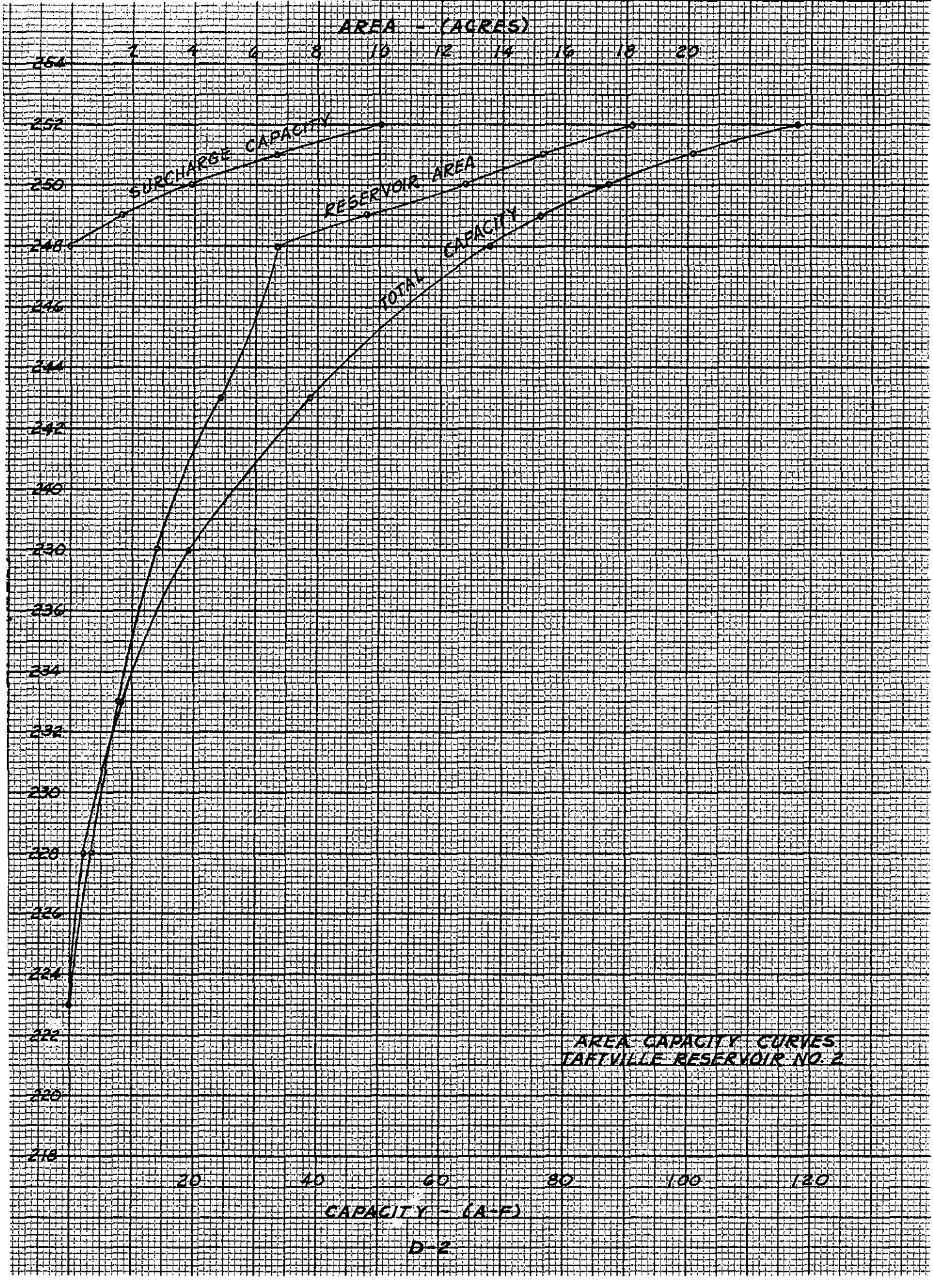
$K_L = 16.5$

$Q = A\sqrt{\frac{2gH_T}{K_L}}$

Elev	H_T	Q
219	0	0
225	6	4.8
230	11	6.5
235	16	7.9
240	21	9.1
245	26	10.1
250	31	11.0

RESERVOIR CAPACITY CURVES

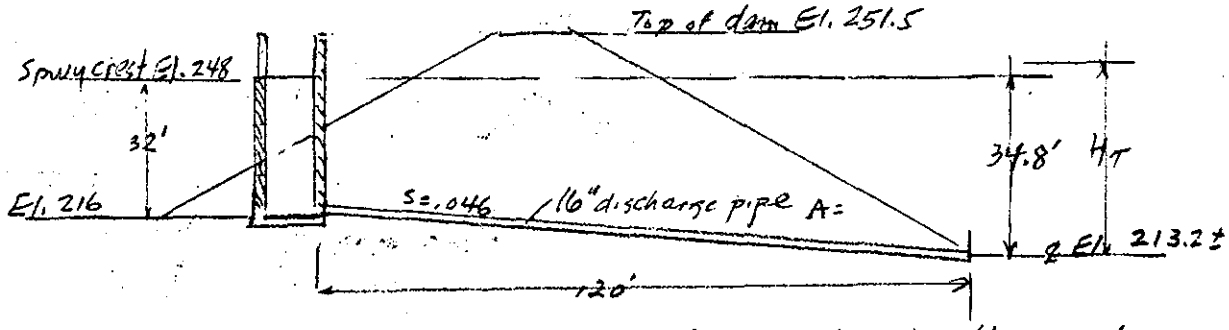
Elev	Area	Average Area	ΔH	Δstor	Σ Storage AF	Surcharge Storage AF
219	-				0	
223	0.06	0.03	4	0.1	0.1	
228	0.83	0.445	5	2.3	2.4	
233	1.62	1.23	5	6.2	8.5	
238	2.77	2.20	5	11.0	19.5	
243	4.93	3.85	5	19.3	38.8	
248	6.70	5.85	5	29.6	67.9	0
249	9.6	8.15	1	8.2	76.1	8.2
250	12.8	11.2	1	11.2	87.3	19.4
251	15.3	14.0	1	14.0	101.3	33.4
252	18.2	16.8	1	16.8	118.1	50.2



AREA CAPACITY CURVES
TAFTVILLE RESERVOIR NO. 2

D-2

SERVICE SPILLWAY



Crest control. Length = 4.0+3.33 = 7.33' Effective length = 7.0'

Elev.	H	Coef.	Q
248	0		0
248.5	0.5	3.0	7.5
249	1.0	2.8	19.5
249.5	1.5	2.6	33.0

Elev	H_T	$Q = 1.395\sqrt{15.33 H_T}$
249	35.8	32.7
250	36.8	33.1
251	37.8	33.6
252	38.8	34.0

Control at end of outlet pipe

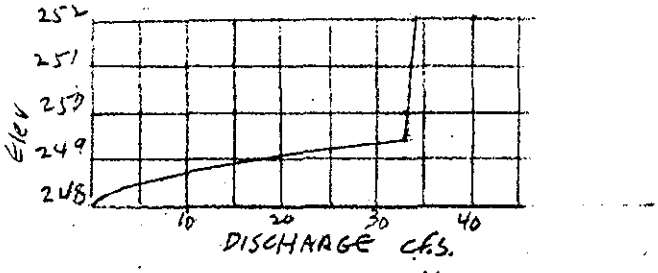
$Q = A\sqrt{\frac{2g H_T}{K_L}}$

$K_{entrance} = 0.5 h_v$

$Friction \frac{fL}{D} = \frac{.03 \times 120}{1.33} h_v = 2.7 h_v$

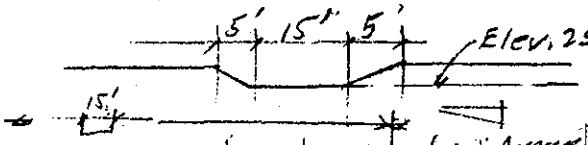
$Exit = 1.0 h_v$

$\Sigma k = K_L = 4.2$



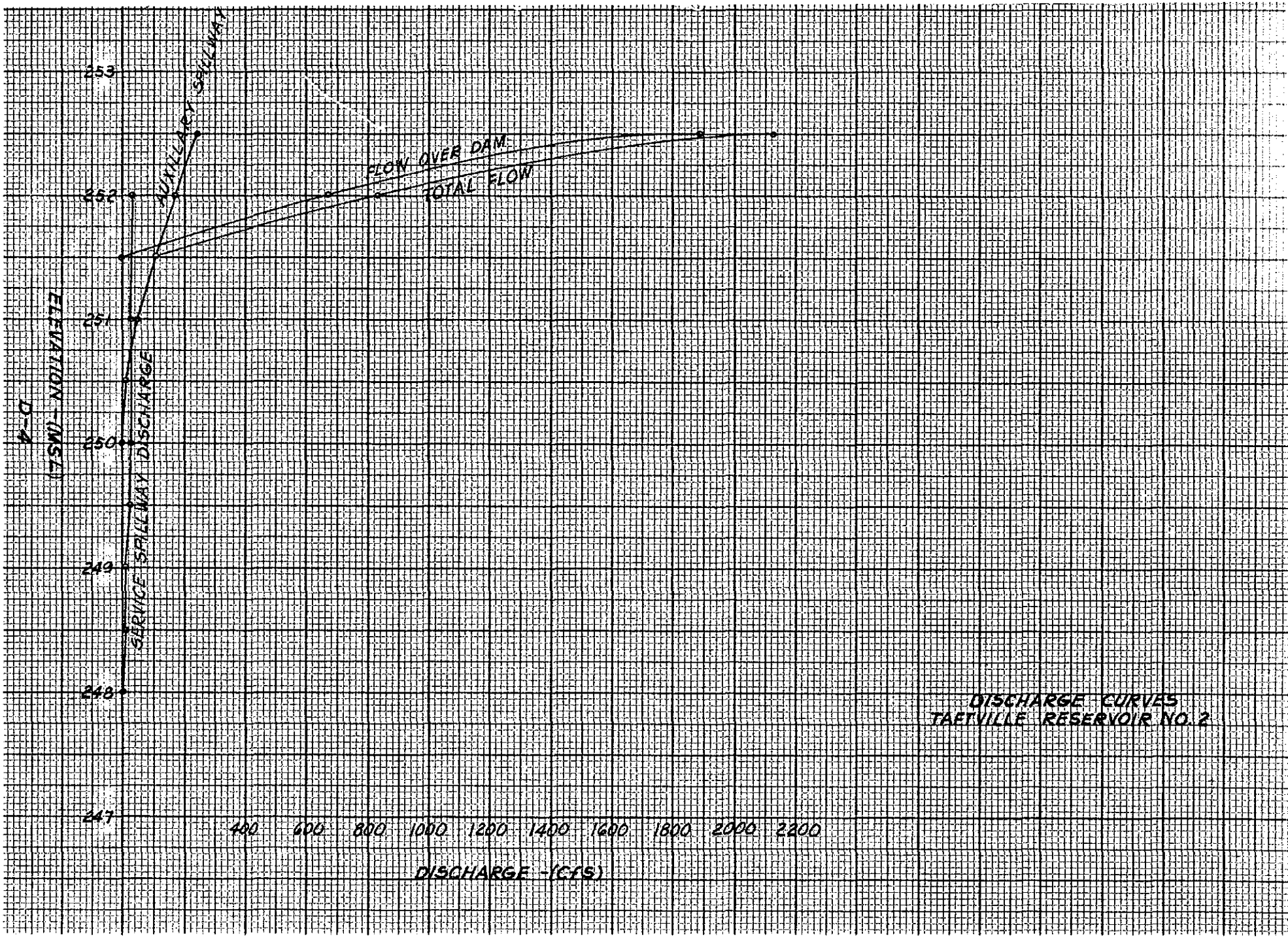
SERVICE SPILLWAY DISCHARGE CURVE

AUXILIARY SPILLWAY



FLOW OVER DAM L = 652'

Elev	H	C	ΔQ	Q/ft	Average Q/ft	L	ΔQ	Σ Q Spwy	H	C	ΔQ DAM	Σ Q TOTAL	
250	0		0					0				0	Aux Spwy crest
250.5	0.5	2.9	15	1.03	0.52	3.33	2	17				17	
251	1.0	2.9	44	2.90	1.45	6.67	10	54				54	
251.5	1.5	2.9	80	5.33	2.67	10.0	27	107			0	107	Top of Dam
252	2.0	2.9	123	8.20	4.62	10.0	46	169	0.5	2.9	668	837	
252.5	2.5	2.9	172	11.46	7.18	10.0	72	244	1.0	2.9	1891	2135	



D-4

DISCHARGE CURVES
TAFTVILLE RESERVOIR NO. 2

DRAINAGE AREA 69 acres = 0.108 sq. mi.

PMP for 6 hour - 24.3 inches

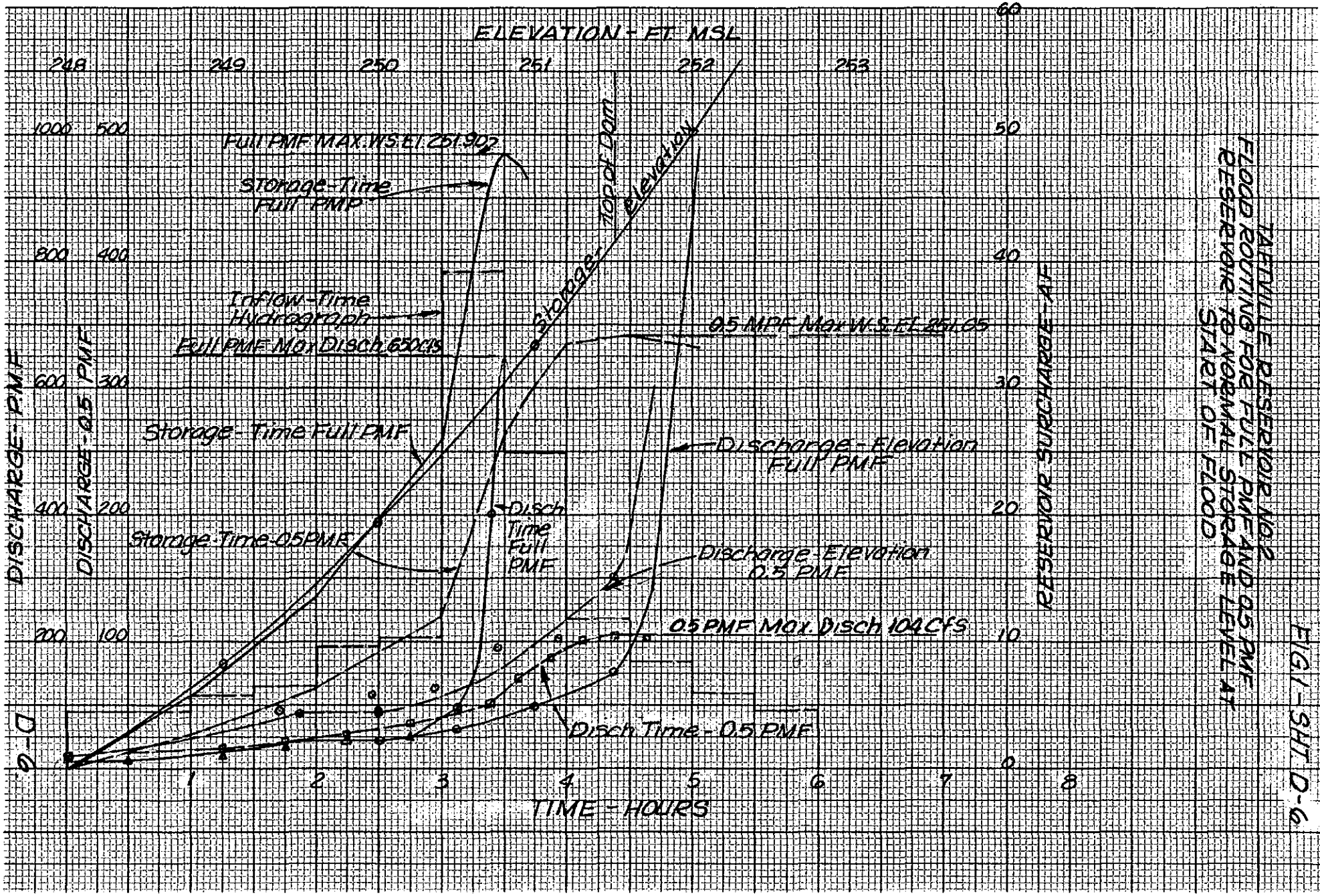
PMP reduced 20% for basin fit = 0.8 x 24.3 = 19.4 inches

Infiltration - 0.1 inches per hour. = 19.4 - 0.6 = 18.8"

1"/hour/sq. mi = 645.3 cfs

For 1"/0.5 hr/.108 sq. mi = 139.4 cfs

Time hrs	Precip %	Precip Δ %	Δ Precip inches	½ hour Precip Rearranged order	½ hour Precip Rearranged inches	Discharge cfs
0.5	30.0	30.0	5.64	(4)	0.66	92
1.0	49.0	19.0	3.57		0.66	92
1.5	58.0	9.0	1.69	(5)	0.85	118
2.0	64.5	6.5	1.22		0.94	131
2.5	70.5	6.0	1.13	(3)	1.03	144
3.0	76.0	5.5	1.03		1.13	158
3.5	81.0	5.0	0.94	(2)	5.64	786
4.0	85.5	4.5	0.85		3.57	498
4.5	89.5	4.0	0.75	(6)	1.69	236
5.0	93.0	3.5	0.66		1.22	170
5.5	96.5	3.5	0.66	(1)	0.75	105
6.0	100	3.5	0.66		0.66	92
						2622


ELEVATION - FT. MSL
248
249
250
251
252
253
1000
500
800
400
600
300
400
200
200
100
DISCHARGE - 0.5 PMF
DISCHARGE - FULL PMF
D-6
Full PMF MAX. W.S. El. 251.90'
Storage-Time Full PMF
Inflow-Time Hydrograph
Full PMF Max Disch 650 cfs
Storage-Time Full PMF
Storage-Time 0.5PMF
Disch Time Full PMF
Inflow Outflow Elevation
Elevation
0.5 MPF Max W.S. El. 251.05
Discharge-Elevation Full PMF
Discharge-Elevation 0.5 PMF
0.5PMF Max. Disch 104 Cfs
Disch Time - 0.5 PMF
1
2
3
4
5
6
7
8
TIME - HOURS
60
50
40
30
20
10
0
FLOOD ROUTING FOR FULL PMF AND 0.5 PMF
RESERVOIR TO NORMAL STORAGE LEVEL AT
START OF FLOOD
TAFTVILLE RESERVOIR NO.2
FIG. 1 - SHT D-6

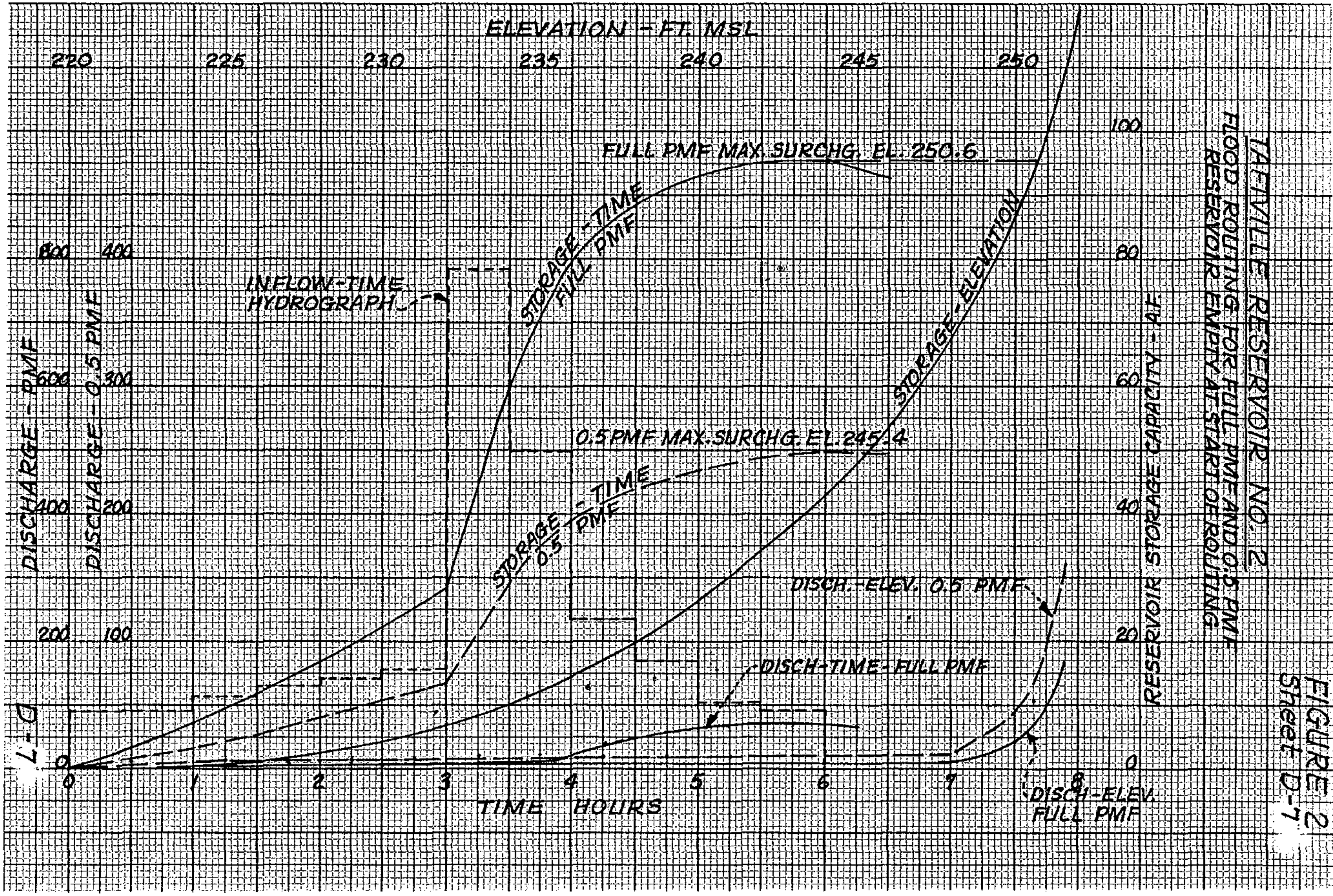
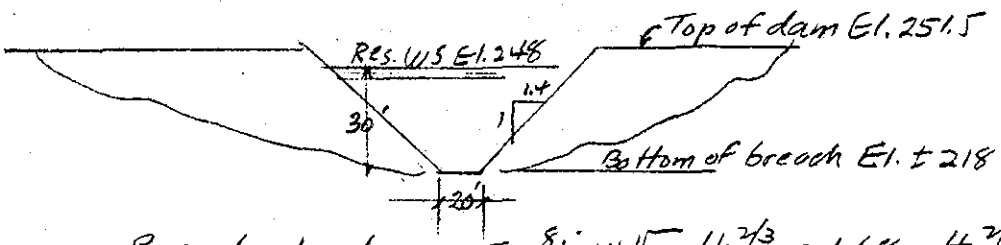


FIGURE 2
Sheet D-7

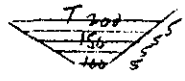


Breach discharge = $\frac{8.}{27} W \sqrt{g}\, H_o^{3/2} = 1.68 W H_o^{3/2}$

Elev	H	q_s cfs/ft	ΔQ	$\Delta\Delta Q$	ΣQ cfs	Average Q c.f.s	Release AF/min	Δ storage Vol. AF	Res. Evacuation time - Min
248	30	276	5520	11600	17,120				
243	25	210	4200	7350	11,550	14335	19.74	29.1	1.47
238	20	150	3000	4200	7,200	9375	12.89	19.3	1.50
233	15	97.5	1950	2050	4000	5600	7.70	11.0	1.43
228	10	53	1060	740	1800	2900	3.99	6.2	1.55
223	5	18.8	376	134	510	1155	1.59	2.3	1.45
								67.9 AF	7.4 min

Stage-Discharge in stream below dam

@ Sta 12+00
(For Sta 0+00 to 24+00)

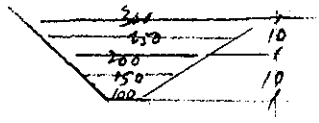


$S = \frac{10}{750} = 0.013$ $S^{1/2} = .1155$ $n = 0.10$

$Q = 1.486 A r^{2/3} S^{1/2}$

d	b	T	ΔA	ΣA	W.P.	r	$r^{2/3}$	Q	
0	100	10	–	0				0	
5	100	125	563	563	126.9	4.44	2.70	2690	6060
10	100	150	1687	1250	153.8	8.13	4.04	8670	9280
15	100	175	813	2063	180.8	11.41	5.07	17950	

@ Sta 39+00
For Sta 30+00 to 48+00



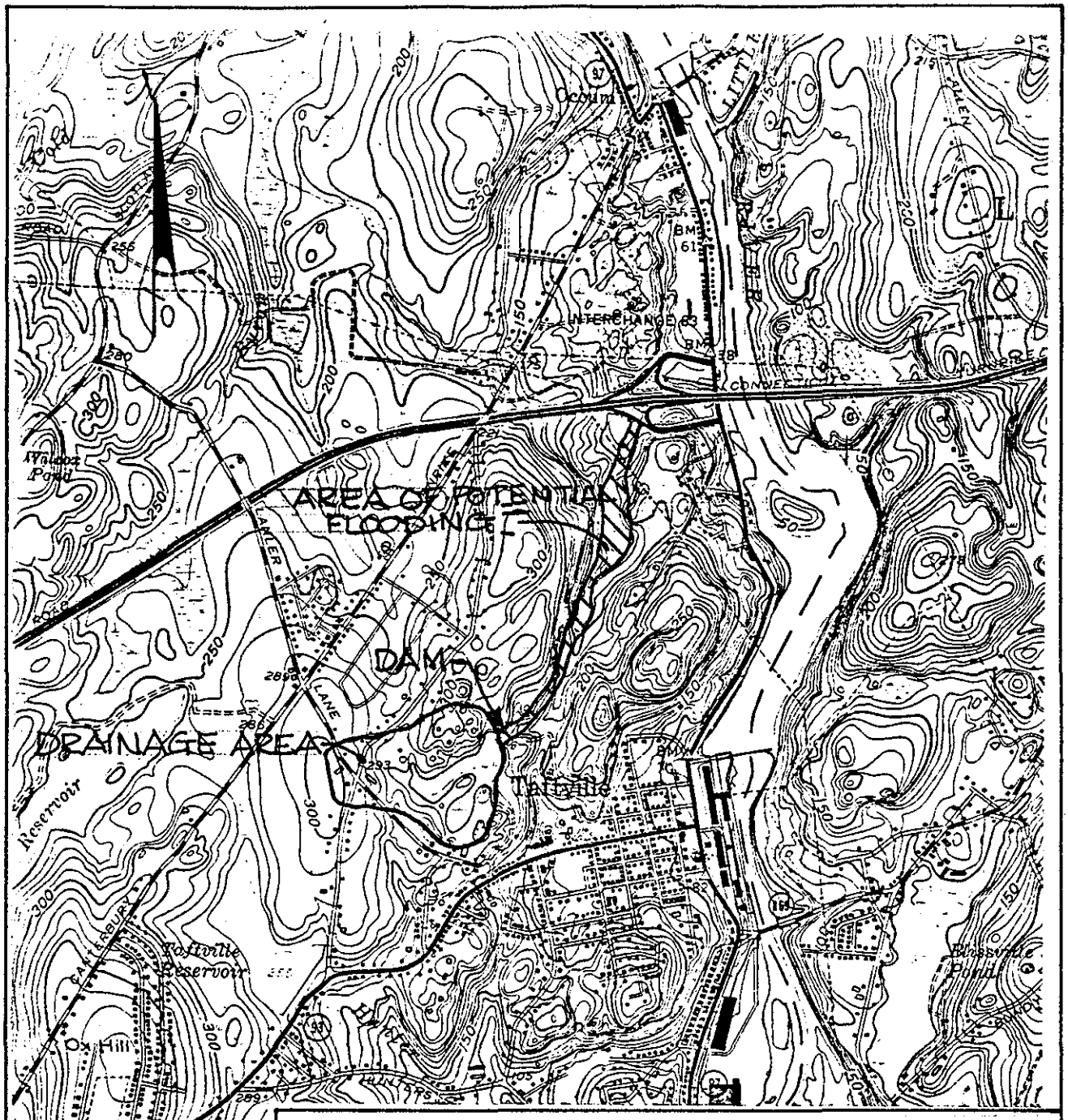
$S = \frac{10}{1200} = .0083$ $S^{1/2} = .0913$ $n = 0.10$

d	b	T	ΔA	ΣA	w.p.	r	$r^{2/3}$	Q	
0	100	0	–	0				0	
5	100	150	625	625	150.99	4.14	2.58	2188	5566
10	100	200	875	1500	201.98	7.43	3.81	7754	
15	100	250	1125	2625	252.97	10,38	4.76	16952	

For total outflow of 67.9 AF $L = 5300'$ Average area = $\frac{67.9 \times 43560}{5300} = 558$ sq ft

Average stage for above stations = ± 5'

Q at Sta 5300 = ± 2000 c.f.s.



LOUIS BERGER & ASSOC., INC WELLESLEY, MASS. ARCHITECT · ENGINEER	U.S. ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS.

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

TAFTVILLE RESERVOIR NO. 2 DAM

DRAINAGE AREA AND AREA OF POTENTIAL FLOODING

STATE - CT.

			SCALE 1:24000
			DATE

APPENDIX E

INFORMATION AS CONTAINED IN THE NATIONAL INVENTORY OF DAMS

INVENTORY OF DAMS IN THE UNITED STATES

(1) STATE	(2) IDENTITY NUMBER	(3) DIVISION	(5) STATE	(4) COUNTY	(6) CONGR DIST.	(7) STATE	COUNTY	CONGR DIST.	(9) NAME	(10) LATITUDE (NORTH)	(11) LONGITUDE (WEST)	(12) REPORT DATE DAY | MO | YR
CT	201	1EG	CT	011	02				TAFTVILLE RESERVOIR NO. 2 DAM	4134.3	7203.5	17JAN79

(13) POPULAR NAME	(14) NAME OF IMPOUNDMENT
	TAFTVILLE RESERVOIR NO. 2

(15) REGION	(16) BASIN	(17) RIVER OR STREAM	(18) NEAREST DOWNSTREAM CITY–TOWN–VILLAGE	(19) DIST FROM DAM (MI.)	(20) POPULATION
01	17	UNNAMED	OCCUM	1	2000

(21) TYPE OF DAM	(22) YEAR COMPLETED	(23) PURPOSES	(24) STRUCTURAL HEIGHT (FT.)	(25) HYDRAULIC HEIGHT (FT.)	(26) IMPOUNDING CAPACITIES MAXIMUM (ACRE–FT.)	(27) IMPOUNDING CAPACITIES NORMAL (ACRE–FT.)
RECTEG	1910	S	30	34	110	68

DIST	OWN	FED R	PRV/FED	SCS A	VER/DATE
FED	N	N	N	N	21FEB79

(28) REMARKS

(29) D/S HAS	(30) SPILLWAY CREST LENGTH	(31) SPILLWAY TYPE	(32) SPILLWAY WIDTH (FT.)	(33) MAXIMUM DISCHARGE (FT.)	(34) VOLUME OF DAM (CY)	(35) POWER CAPACITY INSTALLED (MW)	(36) POWER CAPACITY PROPOSED (MW)	(37) NAVIGATION LOCKS NO.	(38) LENGTH (FT.)	(39) WIDTH (FT.)	(40) LENGTH (FT.)	(41) WIDTH (FT.)	(42) LENGTH (FT.)	(43) WIDTH (FT.)	(44) LENGTH (FT.)	(45) WIDTH (FT.)
Y	667	U	8	10	50766											

(46) OWNER	(47) ENGINEERING BY	(48) CONSTRUCTION BY
CITY OF NORWICH	CHANDLER + PALMER	

(49) REGULATORY AGENCY DESIGN	CONSTRUCTION	OPERATION	MAINTENANCE
NONE	NONE	NONE	NONE

(50) INSPECTION BY	(51) INSPECTION DATE DAY | MO | YR	(52) AUTHORITY FOR INSPECTION
LOUIS BERGER + ASSOCIATES, INC.	07NOV78	PL92-367

(53) REMARKS